

CLAIMS

I claim:

1. A method comprising:

providing a transmit signal;

modifying the transmit signal to form a modified transmit signal;

sending the modified transmit signal out towards one or more targets and towards clutter;

receiving a combination signal back from the one or more targets and from the clutter;

supplying the combination signal to a bank of filters comprised of a plurality of filters;

and

wherein the bank of filters includes a filter for each of the one or more possible targets.

2. The method of claim 1 wherein

each of the plurality of filters of the bank of filters has an input and an output;

the combination signal is supplied to each input and an output signal is produced at each output of each of the plurality of filters; and

wherein a first target is identified by determining which filter's output signal has the greatest amplitude compared to the output signals of the other filters.

3. A method comprising

providing a plurality of receivers, one receiver for each possible target of a pool of targets;

transmitting a transmit signal towards a subject target, wherein the subject target is one of the targets of the pool of targets;

wherein out of the pool of targets, only the subject target is present, such that the transmit signal interacts with the subject target to form a reflected signal;

wherein each of the plurality of receivers receives the reflected signal back from the subject target and produces an output filter signal having an amplitude;

and wherein the subject target is identified by identifying the receiver having greatest output filter signal.

4. The method of claim 3 wherein

the pool of targets is comprised of a plurality of different individual targets.

5. The method of claim 3 wherein

the pool of targets is comprised of two or more physical targets which form a new target.

6. The method of claim 4 wherein

the plurality of different individual targets are a plurality of different kinds of aircrafts.

7. The method of claim 4 wherein

the plurality of different individual targets is comprised of a plurality of different land based transportation vehicles.

8. The method of claim 4 wherein

the plurality of different individual targets includes a plurality of air based targets traveling at a speed faster than any airplane.

9. The method of claim 8 wherein

the plurality of different targets include a missile warhead and the plurality of different targets include a decoy.

10. An apparatus comprising:

a transmitter which sends out a transmits signal;

wherein the transmit signal interacts with the subject target to form a target output (reflected) signal;

wherein the subject target is one of a pool of targets;

further comprising a plurality of filters, one filter corresponding to each of the targets of the pool of targets;

wherein each filter receives the reflected signal and produces an output filter signal having an amplitude;

and wherein the subject target can be identified by identifying which filter has an output filter signal with the greatest amplitude among the plurality of filters.

11. The apparatus of claim 10 wherein

each of the plurality of filters of the bank of filters has an input and an output;

a combination signal, comprised of the reflected signal, a clutter signal and a noise signal is supplied to each input and an output signal is produced at each output of each of the plurality of filters.

12. A method comprising

optimally selecting a transmit signal and a bank of receivers to maximize correct classification of any subject target of a given pool of targets.

13. The method of claim 12 further comprising

selecting the bank of receivers so that each receiver of the bank of receivers minimizes any clutter signal or noise signals.

14. The method of claim 12 wherein

the transmit signal is optimally selected by assuming any target in the given pool of targets may be present.

15. The method of claim 12 wherein

the transmit signal and the bank of receivers are selected to minimize clutter and noise signals using the power spectra of the clutter and noise signals.

16. The method of claim 2 further comprising

generating displays using target data with multidimensional visualization for corresponding target location.

17. The method of claim 16 wherein

each receiver of the bank of receivers has an input and an output;

further comprising calibrating each receiver by applying to the input of each receiver a target only input signal corresponding to a target that each receiver is designed to detect;

wherein each target only input signal simulates a situation where only a single target is present;

wherein each receiver generates an output signal at its output in response to each target only input signal so that a plurality of output signals from a corresponding plurality of

outputs of a corresponding plurality of receivers are generated for each target only input signal, and

wherein the plurality of output signals form a test multidimensional vector for each target only input signal, so that there are a plurality of test multidimensional vectors for a corresponding to a plurality of target only input signals.

18. The method of claim 17 further comprising

receiving at each input of each receiver of the bank of receivers, an actual but unknown target signal comprised of a noise signal, a clutter signal and a signal received from an actual target;

producing in response to the actual target signal an actual output signal at each output of each receiver;

wherein the output signals from all of the receivers of the bank of receivers form an multidimensional vector.

19. The method of claim 18 further comprising

comparing the actual multidimensional vector to the plurality of test multidimensional vectors to determine which target is present.

20. The method of claim 18 wherein

there are a number of items in the multidimensional display vector;

and the number of items in the multidimensional display vector is the same as the number of targets in the target pool.

21. The method of claim 20 further comprising

displaying on a screen in two dimensional format the multidimensional display vector.

22. The method of claim 20 and further comprising

displaying on a screen in three dimensional format the multidimensional display vector.